original researches that are of interest apart from their special physiological bearing. In a series of experiments on the Time-Sense, Mr. L. F. Stevens reaches conclusions directly opposed to those of Vierordt, Mack, and the pupils of Wundt. His method of experimenting, like that of Vierordt, consisted in impressing on the mind intervals of time by means of a metronome, and in reproducing the same after the metronome had been stopped. Vierordt found that the reproduced interval was larger than the standard when this was small; shorter when it was great; and between the two extremes was an interval which could be reproduced quite accurately. This "indifference-point" was not the same for different intervals, but varied between 1.5 and 3.5 seconds. Stevens, on the contrary, finds that there is an interval of time, the value of which varies between .53 and .87 sec., which can be reproduced with considerable accuracy; but with all other intervals an error is made which is *plus* for those above and *minus* for those below the so-called indifference-point. The results of several other experimenters agree with Stevens in fixing the indifference-point at about .71 sec., but otherwise are in accord with Vierordt.

Stevens attempts no explanation of the discrepancy, and leaves the question open, to be solved by future experiment. It seems fair to conclude, however, that we have within us some sort of a "time-keeper" that is set to measure intervals of about .71 sec., but which cannot be trusted to measure accurately intervals either longer or shorter.

In his research on THE PERCEPTION OF SPACE BY DISPARATE SENSES, Dr. Jastrow enters a field almost wholly new, and obtains some interesting and valuable results. His problem has been to compare and determine the relative accuracy of judgments of linear extension by the *eye*, the *hand*, and the *arm*. The comparisons are made by reproducing judgments made (1) by judging lengths by fixating the eyes on them without motion of the eyeball; (2) by judging distances between thumb and forefinger ("span"); and (3) by judging distances by guiding a pencil over them with a free arm movement.

Each sense is in turn made a *receiving* sense and an *expressing* sense, according as it receives the linear impression, or expresses it by a length that is judged to be equal to the first.

Great ingenuity is shown in the construction of the apparatus for receiving the various impressions and expressing the judgments, and the results are important in showing the errors that we all make in judging linear extension.

If the *eye* is both receiving and expressing sense, small lengths will be underestimated, and large lengths exaggerated. If the *hand* is both receiving and expressing sense, small lengths will be exaggerated, and large lengths underestimated. If the *arm* is both receiving and expressing sense, all lengths will be exaggerated.

Taking, now, the cases where the receiving and expressing senses are different; if the eye is the expressing sense, all lengths are greatly underestimated; while if the hand is the expressing sense, all lengths are greatly exaggerated. The arm behaves differently toward each of the other senses, greatly exaggerating lengths whose impressions are received from the eye, and greatly underestimating lengths whose impressions are received from the hand.

In all cases the error decreases as the length (to be reproduced) increases. These results may be formulated by saying that if reproducing one sense by another results in an exaggeration (or underestimation), then reproducing the second sense by the first will result in an underestimation (or exaggeration) to about the same extent. The relative accuracy of the senses is found to be sight, span, motion.

The errors of the blind are like those of normal persons, but are smaller. In comparing the accuracy with which small differences of length can be recognized by blind and by seeing persons, the effect of practice in the use of the hand and the arm shows a marked superiority in favor of the blind. WILLIAM NOYES.

GENERAL PATHOLOGY OF NERVOUS SYSTEM.

A Few Remarks on the Relation of Tabes and General Paresis to Syphilis. By PROF. STRUEMPELL. (*Neurolog. Centralbl.*, No. 19, 1886.)

Prof. Strümpell, who has rapidly advanced to the front rank of German neurologists, has written a short and suggestive, though rather bold, article on an almost trite subject.

First of all, Strümpell is convinced that there is an intimate causal relation between syphilis and tabes. In his cases of tabes, 61% were positively syphilitic, and if all doubtful cases were taken into account, 90% would be the more correct estimate. Regarding syphilis as a toxic infection, Strümpell urges that tabes is, in these cases, an example of the nervous sequelæ (NERVOESE NACHKRANKHEITEN) which so frequently follow upon infectious diseases, *e. g.*, diphtheria and typhoid fever. The author does not believe, by the way, that the primary toxic agent of diphtheria causes these secondary nervous troubles, but that a CHEMICAL POISON found in the body must be held responsible for these later affections. The author recognizes the intimate relation between tabes and general paresis, and is convinced that the latter also is the result of toxic poisoning of the system, which happens, in these cases, to select the brain rather than the cord or the peripheral nerves.

All this is in accord with the views which Prof. Strümpell has published at various times during the past few years. The toxic character of spinal cord and peripheral affections has certainly not been urged more frequently by any one than by the author of the paper under review. We have called this paper "suggestive;" so